New Fishes from Australia and New Zealand

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(Contribution from The Australian Museum, Sydney.)

(Figures 1-2)

Family GALAXIIDAE.

Genus GALAXIAS Cuvier, 1816.

GALAXIAS KAIKORAI, sp. nov.

Galaxias sp. Oliver, Trans Roy. Soc. N. Zeal. lxvi, 1936, pp. 284 and 286; Stokell, *ibid.* lxxv, 1945, pp. 134-136, pls. xi-xii.

This interesting fossil *Galaxias*, though thoroughly dealt with by Stokell in 1945, has not hitherto been specifically named so I propose the new name *kaikorai* for it, the holotype being Stokell's example in the Geological Museum of the University of Otago. It came from Kaikorai, near Dunedin, New Zealand, in diatomaceous shale considered to be probably Late Pliocene.

Family SPHYRAENIDAE.

Genus AUSTRALUZZA Whitley, 1947.

AUSTRALUZZA NOVAEHOLLANDIAE (Gunther).

Sphyraena novaehollandiae Gunther, Cat. Fish. Brit. Mus. ii, 1860, p. 335. Hobson's Bay, Victoria.

Mr. David H. Graham presented to the Australian Museum a snook of this species from the Bay of Islands, caught in October 1955. New record for New Zealand.

Family GOBIOMORIDAE.

GRAHAMICHTHYS, gen. nov.

Orthotype, *Eleotris radiata* Cuvier & Valenciennes, 1837, as identified here.

The fish known as kurahina in New Zealand is not an *Eleotris* (see Whitley, Proc. Roy. Zool. Soc. N. S. Wales 1952-3 (1954), p. 30) but seems nearer *Philypnodon* Bleeker (Arch. Neerl. ix, 1874, p. 301) but it differs from that and other genera of its family in so many respects that a new generic name is advisable. *Grahamichthys* differs from *Philypnodon* in having the nape and much of the anterior portion of the body naked instead of scaly, in having the teeth enlarged and curved (in a single external row with a pair of canines behind the outer arc of each jaw), the mucus-pores of the head arranged in horizontal rather than in subvertical rows, anterior nostrils more widely separated from posterior ones and caudal fin truncate instead of rounded.

Named in honour of Mr. David H. Graham, the author of "A Treasury of New Zealand Fishes."

GRAHAMICHTHYS RADIATUS (Cuv. & Val.).

(Figure 1)

Eleotris radiata Cuvier & Valenciennes, Hist. Nat. Poiss. xii, March 1837, p. 250. *Ex* Quoy & Gaimard, MS. Thames River, New Zealand. *Id.* Richardson, Rept. 12th meet. Brit. Assn. Adv. Sci. 1842 (1843), p. 23. *Id.* Hutton, Trans. N.Z. Inst. v, 1873, p. 263, pl. ix, fig. 45a *et ibid.*, xxviii, 1896, p. 315. *Id.* Waite, Rec. Canterb. Mus. i, 1907, p. 27. *Id.* Phillipps, N.Z. Mar. Dept. Fish. Bull. i, 1927, p. 49. *Id.* Graham, Trans. N.Z. Inst. lxviii, 1928, p. 415 and Treasury N.Z. Fish., 1953, p. 320, fig.

D. vi/i, 11; A. i, 10; P. 20; V. i, 5; C. 13. Sc. circa 30 from level of vent to root of tail (obsolescent anteriorly). Tr. 9 on caudal peduncle.

Head (15 mm.) 3.4, depth (8) 6.5 in standard length (52). Eye (3) 5 in head, 1.5 in interorbital (4.5). Snout, 3.5 mm.; depth of caudal peduncle, 6; maxilla, 6; width of head, 10; predorsal length, 20.

Top of head smooth, without crests. Head scaleless, with rows of small papillae disposed as figured, mostly running subhorizontally. Anterior nostrils in small tubes, well separated from the posterior ones which are porelike and near eyes. Mouth large, oblique, reaching halfway below eye. Hooked uniserial canines around front of jaws, followed by a pair of fangs in each jaw; lateral teeth smaller. Apparently no palatine or vomerine teeth. Maxilla sheathed. Lower jaw prominent; chin terminal. Tongue strongly notched Eye moderate. Opercules rounded, entire. .Gill-openings very wide, separated by a narrow isthmus.

Body rather elongate and compressed posteriorly. Much of the anterior part of the body is naked like the head, predorsal area, and all the breast. Scales are best developed posteriorly, cycloid, minutely ciliated, fairly large, in about 30 transverse rows between tail and level of vent, before which they are spaced and fewer. Body with

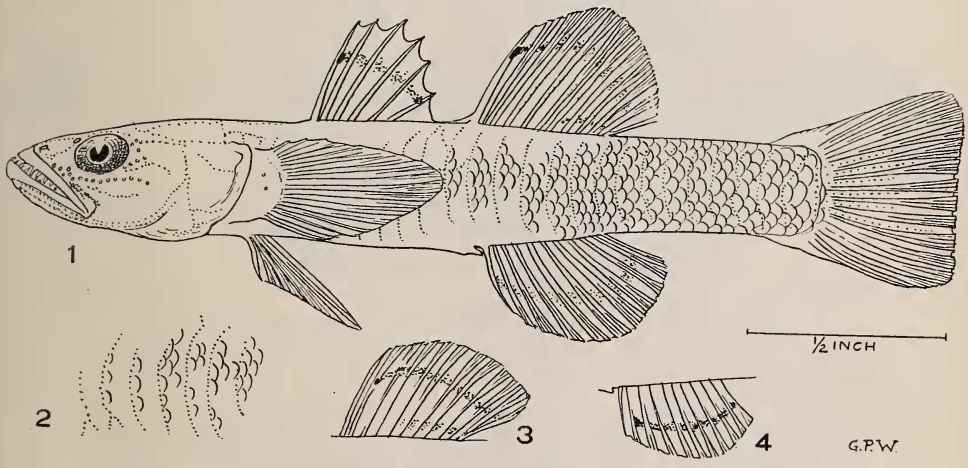

Figure 1.—Kurahina, *Grahamichthys radiatus*. No. 1, Specimen from Marlborough Sounds, New Zealand. 2, scales and pores behind pectoral fin, semidiagrammatic. 3, second dorsal fin of a smaller specimen. 4, anal fin of a smaller specimen.

about 24 subvertical rows of papillae; the rows are short behind the pectoral fin but extend for most of the depth posteriorly; they do not meet across the midline, though a few are joined medially as a sort of lateral line. Pores similar to those on the body extend over the middle caudal rays. Genital papilla well developed.

Dorsal fins separate, rounded, with 6 spines and 11 rays; anal like second dorsal. Pectorals not reaching level of vent. Ventrals separate, each with one spine and five rays, the fifth (innermost) longest. Caudal truncate.

Colour in formalin: uniform light brown. Some dusky blotches on unpaired fins, those on caudal tending to form four or five crossbars. Eye blue.

Described and figured from a specimen (Austr. Mus. regd. No. IB.2441), 63 mm. or nearly 2½ inches long; it is slightly shrunken so that the figure is semidiagrammatic. A smaller one (No. IB.2442), 53 mm. long, has the same data.

Loc.—Marlborough Sounds, Cook Strait, New Zealand; Mr. A. M. Rapson, 1946-7.

This fish appears to be the true "*Eleotris radiata* Quoy & Gaimard" of authors. That species should be credited to Cuvier & Valenciennes (loc. cit., 1837) who took the name from Quoy & Gaimard's MS. and described it from the Thames River. Hutton (1873) figured a virtual topotype, finding the species common at the mouth of the Thames and known as kurahina to the Maori.

The degeneration of scales anteriorly and their alternation with and replacement by crossrows of papillae suggest that *G. radiatus* may have some special habits associated with environment. Somewhat similar papillae are found in some genera of fishes in Australia: *Gymnapogon*, *Austrolethops* and the blind *Milyeringa*.

The unnamed species of *Philypnodon* (Stokell, Freshwater Fishes of New Zealand 1955, p. 59, pl. xx) might be the young of *Grahamichthys radiatus* (Cuv. & Val.), but the shape of the head and size of mouth seem different and there are only about 20 transverse scale-rows between level of vent and tail. *Philypnodon grandiceps* (Krefft, 1864) from Australia has scaly nape, caudal rounded, villiform teeth, and nostrils much closer together.

The species identified by Stokell (Trans. Roy. Soc. N. Zeal. lxx, 1941, pp. 269-272, pl. xxxv, fig. 2 and xxxvi, fig. 5, and Fresh Water Fishes of New Zealand, 1955, p. 55, pl. xviii) as *Gobiomorphus radiata* is not the same as Hutton's kurahina, which I take to be typical "*Eleotris radiata*," so I propose

GOBIOMORPHUS STOKELLI, nom. nov.

for *Gobiomorphus radiata* Stokell, non *Eleotris radiata* Cuv. & Val.

Family GOBIIDAE.

BATMAN, gen. nov.

Orthotype, *Batman insignitus*, sp. nov.

A small marine goby apparently related to *Waitea*, *Amoya*, *Amblygobius*, *Cryptocentrus*, *Ctenogobius* and its subgenus *Yoga*, but differing from them, and other gobies, by having the following characters combined.

Head subcylindrical, naked, with rows (mostly longitudinal) of minute papillae. No barbels, crest, tentacles, or conspicuous ridges; opercles unarmed. Upper jaw overhangs lower; upper lip fully exposed; no teeth on lips. Villiform teeth in bands on jaws; a few enlarged, hooked lateral teeth. Eyes large, superolateral. No transverse groove behind the very narrow interorbital. Tongue not notched.

Body compressed, nearly all covered with small cycloid scales. Shoulder-girdle without fleshy lobes.

Six flexible dorsal spines. Soft dorsal and anal with more than ten rays, free from caudal. No free pectoral rays. Ventral fins united but not adherent to belly; frenum not lobed. Caudal rounded.

BATMAN INSIGNITUS, sp. nov.

(Figure 2)

D. vi/i, 12; A. i, 11; P. 17; V. i, 5; C. 13 main rays. Sc. circa 52. Tr. c. 15 on flanks to 10 on caudal peduncle.

Head (12 mm.) 3.1, depth (9) 4.2 in standard length (38). Predorsal length, 13 mm.; eye, 4; interorbital, 0.5; postorbital, 6; depth of gill-opening, 5; depth of caudal peduncle, 4.5; length of caudal fin, 10; width of head equal to its depth, 8 mm.

Profile declivous, eyes large, superolateral, in front half of head, with narrow concave interorbital. Snout less than eye. Nostrils large, circular; anterior ones with rim, apart from upper lip. Folds of lips well developed, exposed. Upper lip terminal, lower jaw included. Maxillary reaching below pupil, not prolonged, sheathed by suborbital. Lips thick, papillose just before the bands of fine villiform teeth; one or two hooked enlarged teeth each side of lower jaw; apparently no vomerine teeth. Tongue free, convex, not notched. Postorbital less than two-thirds of head. Head and nape naked, crossed by rows (mostly sub-horizontal) of minute papillae. A pore on snout before posterior nostril; one before and one behind interorbital, two behind eye and several more on supraopercular groove and down preoperculum.. No transverse groove behind interorbital area. Gill-openings wide, not reaching below eye, separated by narrow naked isthmus.

Nape and shoulders incompletely scaled. About 52 transverse rows of scales between head and hypural joint. Body deep and com-

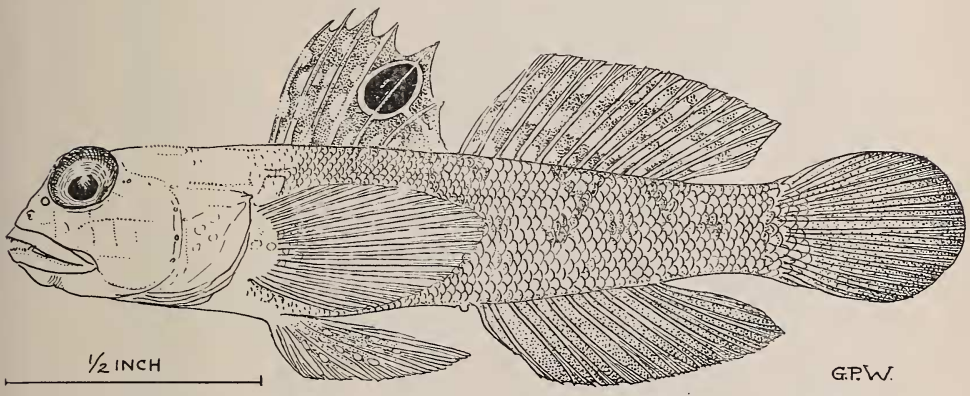

Figure 2.—Signal Goby, *Batman insignitus*. Type from Darwin, Northern Territory.

pressed, mostly covered with cycloid scales which become smaller and sparser anteriorly.

Dorsal fins close together, the first elevated. Base of anal less than that of second dorsal. Pectorals large, some lower rays longest, but shorter than head; no free silk-like rays. Ventrals long, reaching anal origin, united by broad frenum forming a funnel. Caudal rounded, shorter than head, its accessory rays not remarkably developed.

Colour in alcohol fairly uniform light brown with some diffuse darker cross-bars and lateral blotches; yellowish on face and lower surfaces. Some pale spots on opercles, pectoral bases, and on central membranes of dorsal surface of ventral fins. Eye blue with silvery iris.

First dorsal fin dark brown with several cream spots; a conspicuous black ocellus surrounded by a whitish ring about the fifth spine. Second dorsal fin with alternating brown and cream markings. Anal and caudal infuscated brownish, both darkest distally. Paired fins pale brownish-yellow.

Described and figured from the unique holotype (Australian Museum regd. No. IA.4299), a specimen 48 mm. or $1\frac{7}{8}$ inches in total length.

Loc.—Port Darwin, Northern Territory of Australia; collected by the late A. A. Livingstone in 1929.

The ornate first dorsal fin, the fin- and scale-counts with the bluff head and convex tongue distinguish the new species from all known Australian gobies.

The ocellus on the spinous dorsal suggests one of the bats with which servicemen signal approaching aircraft to land on a carrier's deck, hence the generic name, *Batman*. Possibly the fish signals to others of its kind by erecting the dorsal fin to show the ocellus which would be hidden when the fin is laid back: *insignitus* is Latin for "marked so as to be known," from *insigne*, a signal. For this fish I suggest the vernacular name Signal Goby.

A larger paratype (Austr. Mus. regd. No. IA.3755), 104 mm. or just over four inches long, from Thursday Island, Queensland (Mr. M. Ward, August 1928), differs very little from the holotype. It has an outer row of enlarged teeth in upper jaw; one outer anterior and two to three inner lateral enlarged, crooked teeth on lower jaw; first dorsal fin brown with conspicuous cream spots and bars, the dark ocellus diffused; about five rows of dark blotches along second dorsal membranes; caudal about as long as head.

Range.—North Queensland and Northern Territory of Australia.

Mars auropunctatus Tomiyama (Jap. Journ. Ichth. iv, 1956, p. 6, fig. 5) from Japan is rather like *Batman insignitus* but differs in having lower jaw the longer, larger scales, more pectoral rays, and caudal fin longer than head.

Genus ARENIGOBIUS Whitley, 1930.

ARENIGOBIUS FRENATUS (Gunther).

Gobius frenatus Gunther, Cat. Fish. Brit. Mus. iii, 1861, p. 39. Australia.

Gobius semifrenatus Macleay, Proc. Linn. Soc. N. S. Wales v, 1881, p. 598. Port Jackson, N. S. Wales. *Id.* McCulloch & Ogilby, Rec. Austr. Mus. xii, 1919, p. 244, pl. xxxiv, fig. 2.

When at the British Museum (Natural History) in 1937, I examined some small fishes from "Mr. Gould's collection," the types of a goby, *Gobius frenatus* Gunther (46.10.22, Nos. 48 to 54) from "Australia," evidently from Sydney. They had dark spots on top of the head, oblique bars on dorsal fin, and other features as in McCulloch & Ogilby's figure of *G. semifrenatus*. Therefore Macleay's name becomes a new synonym of *Arenigobius frenatus* (Gunther), as the fish is now known.

Genus OPLOPOMUS Cuvier & Valenciennes, 1837.

OPLOPOMUS CANINOIDES (Bleeker).

Gobius caninoides Bleeker, Nat. Tijdschr. Ned. Ind. iii, 1852, p. 274. Amboina.

Oplopomus vergens Jordan & Seale, Bull. U.S. Bur. Fisher., xxvi, 1906 (1907), p. 44, fig. 17. Cavite, Philippines.

Oplopomus caninoides Koumans, Fish. Indo-Austr. Archip. x, 1953, p. 31 (refs. & synon.).

One specimen, $2\frac{3}{8}$ in. long, from Darnley Island, Queensland (Austr. Mus. reg. No. I.14851).

New record for Australia.